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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,670	02/19/2002	Roger R. Lesieur	C-2407 Cont.	2838

7590 10/18/2004

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EXAMINER	
NGUYEN, TAM M	
ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/076,670	LESIEUR ET AL.	
	Examiner	Art Unit	
	Tam M. Nguyen	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

The terminal disclaimer filed on May 28, 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 6,454,935 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent No. 6,533,924. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims claim a desulfurizing process by contacting a fuel stream with a nickel reactant station.

The patented claimed set does not disclose that the fuel stream is a diesel fuel. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the patented claimed process by treating a diesel fuel because any

hydrocarbon fuel which contains sulfur can be treated in the process. Therefore, it would be expected that diesel would be effectively treated in the patented claimed process.

Claims 1-12 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, and 4-11 of copending Application No. 10/042,056. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims claim a desulfurizing process by contacting a fuel stream with a nickel reactant station.

The patented claimed set does not claim that the low sulfur content fuel is suitable for use in an internal combustion engine. However, the low sulfur content fuel of the patented claimed set is a hydrocarbon fuel. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the patented claimed set by utilizing the low sulfur fuel in an internal combustion because a hydrocarbon fuel is suitable in any fueling system which is either a fuel cell power plant or an internal combustion engine.

The patented claimed set does not disclose that the fuel stream is diesel fuel. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the patented claimed process by treating a diesel fuel because any hydrocarbon fuel which contains sulfur can be treated in the process. Therefore, it would be expected that diesel would be effectively treated in the patented claimed process.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Setzer et al. (3,485,746).

Applicants are claiming several methods for desulfurizing a feed which involve processing an oxygenate containing feed over a nickel desulfurization station.

The reference of Setzer et al.(3,485,746) discloses a process for desulfurizing a hydrocarbon fuel containing organic sulfur compounds such as thiophenes and mercaptans for use in a fuel cell. See column 1, lines 20-25 and column 2, lines 35-43. The disclosed process is suitable for processes that are affected by trace amounts of sulfur. See column 1, lines 22-23. The process involves adding water (steam) to a fuel and contacting the water containing fuel with nickel metal. See Fig.1, page 1, column 1, lines 62-66. The desulfurization is conducted at a temperature of 500-900°F. See column 1, lines 69-70. The nickel bed is converted to nickel sulfide. See column 3, lines 26-29. The reference further teaches that it is thought that oxygen from the steam forms a protective layer on the nickel particles, thereby preventing undesirable coke formation in the bed. See column 3, lines 32-45.

The reference of Setzer et al.(3,485,746) succeeds in disclosing a process for desulfurizing a fuel suitable for use in fuel cells. The reference succeeds at disclosing the addition of an oxygenate in the form of water. In addition, the reference succeeds in disclosing a nickel reactant-absorbent for converting organic sulfur compounds to nickel sulfide which is considered to correspond to applicants' desulfurization station.

Several differences are noted between the reference of Setzer et al.(3,485,746) and applicants' claimed invention. The reference is silent about the process effluent containing less than 0.05 ppm sulfur. The reference also does not disclose the fuel stream is a gasoline or a diesel fuel.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a gasoline or diesel fuel because it appears that any hydrocarbon fuel can be employed in the process of Setzer to remove sulfurs. Therefore, one of skill in the art would use

any hydrocarbon fuel including gasoline or diesel fuel which contains sulfur and it would be expected that the results would be the same or similar when using gasoline, diesel fuel, or any other hydrocarbon fuel in the process of Setzer et al.(3,485,746) because gasoline, diesel and the Setzer feed are hydrocarbon fuels. Consequently, when gasoline or diesel are employed in the process of Setzer et al.(3,485,746), the gasoline or diesel product, which is well known, can be used in an internal combustion engine.

Since the modified process of Setzer is similar to the claimed process in terms of feedstock, reactant, and oxygenate, it would be expected that the product of Setzer would have less than 0.5 ppm sulfur as claimed.

Claims 10-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Setzer et al.(3,485,746) in view of Jackson et al. (6,348,075).

See teachings of Setzer et al.(3,485,746) and statements of obviousness above.

Several additional differences are noted between the reference of Setzer et al.(3,485,746) and applicants' claimed invention.

Setzer et al.(3,485,746) does not disclose maintaining the desulfurization station (nickel bed) at a temperature in the range of 300-450°F. The reference also does not disclose the production of isobutylene and methanol.

The reference of Jackson is cited to show that conventional gasoline contains oxygenates including, methanol, ethanol and ether. See column 8, line 38 through col. 9, line 3. Such compounds are known to have high blending octanes in an internal combustion engine.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to treat the fuel containing oxygenates such as methanol, ethanol or MTBE (methyl

tertiary butyl ether) as taught by Jackson et al. (6,348,075) because Jackson et al.(6,348,075) illustrates that it is conventional for such gasoline to contain oxygenates which are known to desirably have high blending octanes and because any hydrocarbon fuel can be used in the process regardless of whether or not the hydrocarbon fuel contains oxygenate (see the statement of obvious above). In addition, applicants' methanol/isobutylene production limitations are not considered to be patentable distinctions because the formation of isobutylene or methanol would naturally result from processing a feed containing the oxygenates of Jackson (6,348,075) over the nickel catalyst of Setzer et al.(3,485,746).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to accomplish the desulfurization of Setzer et al.(3,485,746) at a temperature of 450°F because, from Fig. 2, one would learn that the process of Setzer et al. would be operable at a low temperature such as 450° C and at such temperature, it would be expected that the breakthrough time would be less. This may result in more frequent catalyst regenerating. However, operating at lower temperature would not affect the overall removal of sulfur in the process. Therefore, one of ordinary skill would be motivated to select a specific elevated temperature which accomplishes a desired level of desulfurization, such as the specific temperature claimed by applicants because it would be expected that the results would be the same or similar when operating the process of Setzer et al.(3,485,746) at either 500 or 450° F.

Response to Arguments

The argument that what does the examiner mean by "the modified process of Setzer" and the Examiner cannot use Applicants' own teaching to modify the reference and where does the

alleged modification of the prior art process come from is not persuasive. The modified process of Setzer is the process which is operated at a temperature of from 300 to 450° C. The examiner does not use Applicants's own teaching to modify the reference because when the prior art discloses a range reasonably similar or close to the claimed range, prima facie obviousness is established due to the expectation of similar results for similar ranges. *See Titanium Metals Corp. of America V. Banner*, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Further, it is determined that extrapolation of the graph in Figure 2 of Setzer reasonably would have suggested that operating temperatures of 450° F (232° C) would have produced successful results, i.e., breakthrough times of about 4 hours.

The argument that it is extrapolated that the breakthrough time would be zero hours before or at reaching an operating temperature of 450° F is not persuasive because the extrapolated graph intersects the X-axis (at zero breakthrough time) at approximately 410° F (210° C).

The argument that Setzer does not suggest that an operating temperature of less than 500° F would be desirable is not persuasive because the test of obviousness is what the teachings and disclosures of the prior art would have suggested to one of ordinary skill in the art, even including unpreferred embodiments. *See In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976).

The argument that neither Setzer nor Jackson suggest the desirability of using a nickel reactant bed to convert an oxygenate to another compound is not persuasive. One of skill in the art would treat any fuel including fuel that contains oxygenates of Jackson in the process of Setzer, in view of the proposed reaction mechanism taught by Setzer (See col. 3, lines 38-49).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (571) 272-1452. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tam M. Nguyen
Examiner
Art Unit 1764

TN

Walter D. Griffin
Primary Examiner